

CLAIMS

1. An immunogenic composition comprising:
 - (a) an immunostimulating amount of a *Neisseria* antigen; and
 - (b) an immunostimulating amount of an adjuvant composition comprising an oligonucleotide comprising at least one CG motif.
2. The composition of claim 1, wherein said *Neisseria* antigen is selected from the group consisting of a protein, protein-polysaccharide, protein-lipopolysaccharide, polysaccharide, and lipopolysaccharide.
3. The composition of any preceding claim, wherein said *Neisseria* antigen is from *Neisseria meningitidis* or *Neisseria gonorrhoeae*.
4. The composition of claim 3 wherein said *Neisseria* antigen is a *Neisseria meningitidis* serogroup B peptide.
5. The composition of claim 4 wherein said peptide comprises SEQ ID NO:31.
6. The composition of any preceding claim, wherein component (b) further comprises a second adjuvant.
7. The composition of claim 6, wherein said second adjuvant comprises an oil droplet emulsion.
8. The composition of claim 7, wherein said oil droplet emulsion comprises a metabolizable oil and an emulsifying agent.
9. The composition of claim 8, wherein said oil and said emulsifying agent are present in the form of an oil-in-water emulsion having oil droplets substantially all of which are less than 1 micron in diameter and wherein said composition exists in the absence of any polyoxypropylene-polyoxyethylene block copolymer.
10. The composition of claim 9, wherein said oil is an animal oil, an unsaturated hydrocarbon, a vegetable oil, or a terpenoid.
11. The composition of claim 10 wherein said terpenoid is squalene.
12. The composition of any one of claims 8 to 11, wherein said composition comprises 0.5 to 20% by volume of said oil in an aqueous medium.

13. The composition of any one of claims 8 to 12, wherein said emulsifying agent comprises a non-ionic detergent or a polyoxyethylene sorbitan mono-, di-, or triester or a sorbitan mono-, di-, or triether.

5 14. The composition of any one of claims 8 to 13, wherein said composition comprises 0.01 to 0.5 % by weight of said emulsifying agent.

15. The composition of any preceding claim, further comprising a separate immunostimulating agent.

16. The composition of claim 15 wherein said immunostimulating agent is selected from the group consisting of a bacterial cell wall component and muramyl peptide.

10 17. The composition of any one of claims 6 to 17, wherein said second adjuvant comprises alum, incomplete Freund's adjuvant (IFA), or complete Freund's adjuvant (CFA).

18. The composition of any preceding claim, wherein said oligonucleotide comprises at least one phosphorothioate bond.

19. The composition of any preceding claim, wherein said oligonucleotide comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, 20 SEQ ID NO:25, SEQ ID NO:26, and SEQ ID NO:27.

20. The composition of any preceding claim, wherein said oligonucleotide comprises a CG motif flanked by two purines immediately 5' to said motif and two pyrimidines immediately 3' to said motif.

21. The composition of claim 20, wherein said oligonucleotide comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, and SEQ ID NO:25.

30 22. The composition of any preceding claim, further comprising one or more of the following proteins:

- a protein disclosed in WO99/57280, or an immunogenic fragment thereof;

- a protein disclosed in WO99/36544, or an immunogenic fragment thereof;
- a protein disclosed in WO99/24578, or an immunogenic fragment thereof;
- a protein disclosed in WO97/28273, or an immunogenic fragment thereof;
- a protein disclosed in WO96/29412, or an immunogenic fragment thereof;
- 5 • a protein disclosed in WO95/03413, or an immunogenic fragment thereof;
- a protein disclosed in WO99/31132, or an immunogenic fragment thereof;
- a protein disclosed in WO99/58683, or an immunogenic fragment thereof;
- a protein disclosed in WO99/55873, or an immunogenic fragment thereof; and/or
- a protein disclosed in GB-9928197.4, or an immunogenic fragment thereof.

10 23. A vaccine composition comprising:

- a) an immunostimulating amount of a *Neisseria* antigen; and
- b) an immunostimulating amount of an adjuvant composition comprising an oligonucleotide comprising at least one CG motif.

15 24. The vaccine composition of claim 23, wherein component (b) further comprises a second adjuvant.

25 25. The vaccine composition of claim 23 or claim 24, wherein said peptide comprises SEQ ID NO:31.

26 26. The vaccine composition of any one of claims 23 to 25, as further defined in any one of claims 2 to 21.

20 27. An adjuvant composition comprising:

- a) an oligonucleotide comprising at least one CG motif; and
- b) complete Freund's adjuvant.

28. The composition of claim 27 wherein said oligonucleotide comprises at least one phosphorothioate bond.

25 29. The composition of claim 27 wherein said oligonucleotide comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19,

SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, SEQ ID NO:25, SEQ ID NO:26, and SEQ ID NO:27.

30. The composition of claim 27 wherein said oligonucleotide comprises a CG motif flanked by two purines immediately 5' to said motif and two pyrimidines immediately 3' to said motif.
- 5 31. The composition of claim 30 wherein said oligonucleotide comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, and SEQ ID NO:25.
- 10 32. A method of stimulating an immune response in a host animal comprising administering to said animal a composition of any one of claims 1 to 22 in an amount effective to induce an immune response.
33. The method of claim 32 wherein said host animal is a mammal.
- 15 34. A method of immunizing a host animal against *Neisseria* infection comprising administering to said animal a composition of any one of claims 23 to 26 in an amount effective to induce a protective response.
35. The method of claim 34 wherein said host animal is a mammal.
36. The method of claim 35 wherein said mammal is a human.
- 20 37. A method of immunizing a host animal against *Neisseria meningitidis* comprising administering to said animal a composition of any one of claims 23 to 26 in an amount effective to induce a protective response, wherein said antigen is a *Neisseria meningitidis* group B peptide.
38. The method of claim 37 wherein said peptide comprises SEQ ID NO:31.
39. The method of claim 38 wherein said host animal is a human.
- 25 40. A composition as defined in any one of claims 1 to 29 for use a pharmaceutical.
41. Use of a composition as defined in any one of claims 1 to 31 in the manufacture of a medicament for inducing an immune response in an animal.
42. Use according to claim 41 wherein the composition is a composition as defined in claim 1 and the medicament is for inducing a protective immune response in an animal.